REMARKS

This Amendment is responsive to the Office Action dated August 22, 2005. Applicants have amended claims 23-26 and 28. Claims 1-5, 7-20, 23-35, 37 and 38 are pending.

The Finality of the Office Action is Improper

The Office Action raised new grounds of rejection. However, the new grounds of rejection were not necessitated by Applicants' amendments in the previous response. To be sure, the limitations added to the independent claims in the previous response were taken directly from dependent claim 6, which was then canceled. Thus, the Examiner should have previously considered the limitations of former claim 6, and Applicants' incorporation of such limitations into the independent claims did not raise new issues. For this reason, the finality of the current Office Action is improper and must be withdrawn.

Claim Rejections under 35 U.S.C. §112

The Office Action rejected claims 23-26 and 28 under 35 U.S.C. §112, second paragraph. Specifically, the Office Action rejected claims 23-26 and 28 because these claims depend upon a canceled base claim. In order to overcome the rejections under 35 U.S.C. §112, second paragraph, Applicants have amended claims 23-26 and 28 so that these claims now properly depend upon independent claim 17. In view of these changes, the rejections under 35 U.S.C. §112, second paragraph, have been overcome.

Claim Rejections under 35 U.S.C. §102 and §103

The Office Action rejected claims 1-3 under 35 U.S.C. §102(b) as being anticipated by McGuiness (US 6,104,416) and rejected claims 4-5, 7-20, 23-26, 28-35, 37, and 38 under 35 U.S.C. §103(a) as being unpatentable over McGuiness (US 6,104,416) in view of Kohn (US 6,335,950).

All pending rejections under 35 U.S.C. §102 and §103 are improper. In particular, the analysis in the Office Action appears to be based on a fundamental misunderstanding of the features of the current claims, and/or a misinterpretation of the teaching of the McGuiness reference.

In the previous response, Applicants amended all pending independent claims to clarify that the invention defines a single command that causes a programmable video direct memory access (VDMA) controller to fetch a multidimensional block of video data from multiple non-contiguous rows of the memory. Again, this previous amendment simply incorporated limitations of original dependent claim 6 into the independent claims, and therefore did not necessitate the new grounds of rejection.

The current Office Action indicated that McGuiness teaches a command that causes a programmable VDMA controller to fetch a multidimensional block of video data from multiple non-contiguous rows of the memory. However, McGuiness does not suggest such a command. Instead, McGuiness describes a system in which multiple commands are executed to fetch a multidimensional block of video data. Moreover, to the extent that McGuiness teaches the use of a signal memory "burst" (which is not necessarily one command) to access multiple rows from memory, the multiple rows accessed by such a memory burst are arranged in a contiguous fashion in the memory. Therefore, even if the memory burst of McGuiness were construed as a single command, McGuiness still does not suggest the fetching of video data that is stored in non-contiguous rows of memory, as required by the claims. In fact, McGuiness does not teach or suggest the fetching of any data from memory that is non-contiguous, much less a command that causes a programmable VDMA controller to fetch a multidimensional block of video data from multiple non-contiguous rows of the memory.

As outlined in Applicants' specification, a single command that causes a programmable VDMA controller to fetch a multidimensional block of video data from multiple non-contiguous rows of the memory can simplify read and write operations during video encoding by reducing or eliminating a high number of address calculations that would otherwise be necessary to locate the multidimensional block of video data stored in the non-contiguous rows of the memory. Again, the system of McGuiness, in contrast to the features of Applicants' claims, requires multiple commands to fetch a multidimensional block of video data from non-contiguous rows, and only contemplates memory bursts that may fetch multiple contiguous rows (rather than non-contiguous rows).

Independent claim 1 recites a system comprising a memory having linearly addressable storage units to store video data, and a programmable video direct memory access (VDMA) controller to access the storage units of the memory in response to a command specifying a

multidimensional block of video data and fetch the multidimensional block of video data from multiple non-contiguous rows of the memory in response to the command.

Independent claim 9 recites a method comprising receiving a direct memory access (DMA) command from a processor to transfer a multidimensional block of video data, generating a set of source addresses and a set of destination addresses for the multidimensional block of video data in response to the command, wherein the set of source addresses correspond to multiple non-contiguous rows of a source memory, and copying video data from the source memory to a destination memory according to the source addresses and destination addresses in response to the command.

Independent claim 17 recites a device comprising a first memory to store a candidate video block to be encoded, a second memory to store a set of video data blocks from which to encoded the candidate video block, a differential calculator to calculate differential metrics between the candidate video block and the set of video blocks; and a programmable video direct memory access (VDMA) controller to copy the candidate video block and the set of video blocks from a video memory to the first memory and the second memory, respectively, wherein the VDMA controller copies the set of blocks to the second memory in response to a single direct memory access (DMA) command specifying a multidimensional search space of video data stored within the video memory in multiple non-contiguous rows.

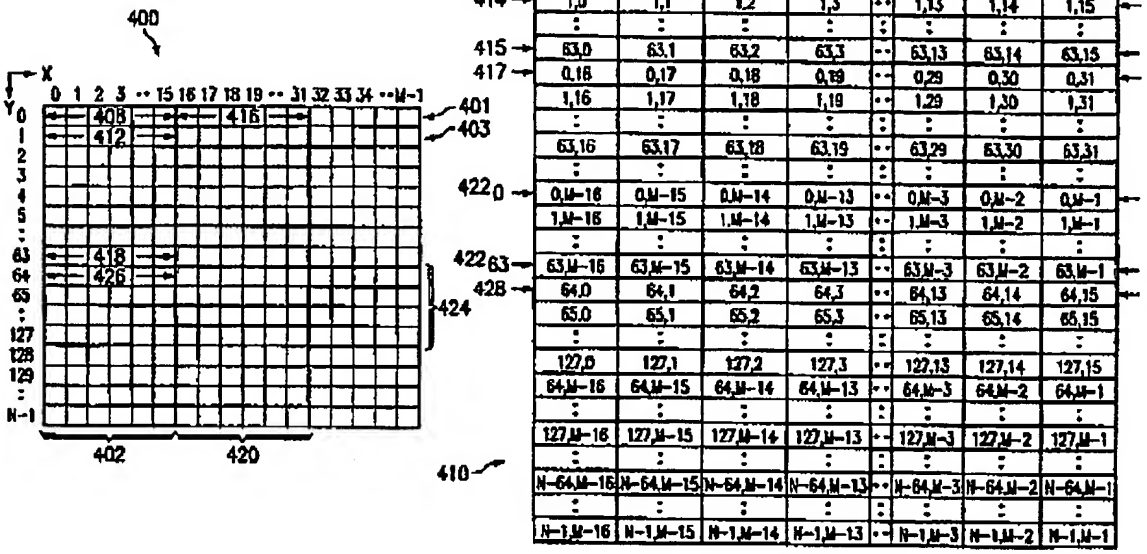
Independent claim 31 recites a device comprising means for receiving a direct memory access (DMA) command from a processor to transfer a multidimensional block of video data, means for generating a set of source addresses and a set of destination addresses for the multidimensional block of video data in response to the command, wherein the set of source address correspond to multiple non-contiguous rows of a source memory, and means for copying video data from the source memory to a destination memory according to the source addresses and destination addresses.

Again, the Office Action indicated that McGuiness discloses a command that causes a programmable VDMA controller to fetch a multidimensional block of video data from multiple non-contiguous rows of the memory. This conclusion is clearly erroneous. In McGuiness, there is no discussion of a command that causes a fetch of a multidimensional block of video data from non-contiguous rows in memory. On the contrary, McGuiness appears to require multiple commands to fetch a block of video data. Furthermore, to the extent that McGuiness describes

memory "bursts" that may access multiple rows of a tile, the multiple rows of the tile are stored in a contiguous fashion.

FIG. 7 of McGuiness was cited in the Office Action, and is copied below.

FIG. 7



The Office Action cited FIG. 7 and the corresponding description at column 12, lines 32, as describing a process of loading several rows of video data. In the McGuiness discussion, however, each row of the video data is assigned a unique "word address" in memory. In particular, as described by McGuiness:

> All of the pixels in the first row 406 of the first tile 402 are read by reading a first word 408 of the memory 410. See column 12, lines 34-36.

Furthermore, McGuiness indicates that:

> The next row 403 is read by repeating the above process starting by reading word 414 having a word address of the first word, plus one. See column 12, lines 46-48.

From these passages, it appears that McGuiness is not using a signal command to fetch a multidimensional block of video data, whatsoever, much less fetch from multiple non-contiguous

rows of the memory. Instead, McGuiness describes separate word addresses that are "repeated" row by row in order to fetch video data.

Moreover, all data fetched from memory by the McGuiness system appears to be stored in contiguous rows of memory. Indeed, the teaching of McGuiness does not appear to be concerned with reading non-contiguous rows of memory, whatsoever, as required by Applicants' claims. Instead, McGuiness appears to be rearranging a video image such that a video "tile" is stored in contiguous memory. Therefore, even if McGuiness allows a single "burst" to fetch more than one row of a given tile, the burst would still fetch from contiguous rows of memory (rather than from non-continuous rows of memory as required by Applicants' claims). See column 9, lines 1-10. Furthermore, at column 10, lines 59-66, McGuiness also indicates that with respect to FIG. 7:

> A location in memory is selected as the first word 408, and the data in the first row 406 of the first tile 402 of the picture, is stored in the first word 408. The data in a subsequent row 412 of the first tile is stored in the next word 414. This is continued until the last row 418 of the tile. Storing a row of the tile 402 in a word directly after the word that stores the preceding row of the tile 402 enables easy retrieval of the rows in a single burst... Column 10, lines 59-66.

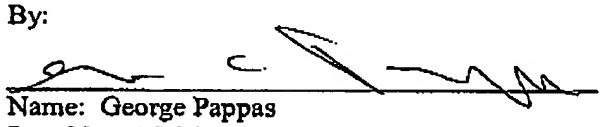
In clear contrast to McGuiness, which rearranges the storing of video data to store the rows of a tile in a contiguous fashion, Applicants' claimed techniques allow single command access to a block of video data that is stored in non-contiguous fashion. In particular, Applicants' claims require a command that specifies a multidimensional block of video data and fetches the multidimensional block of video data from multiple non-contiguous rows of the memory. Nothing in McGuiness suggests a command that fetches anything from non-contiguous rows of the memory. Instead, McGuiness teaches tile re-arrangement in a manner that may allow bursts to contiguous rows of the memory to fetch a tile.

Since nothing in McGuiness suggests a command that fetches video data from non-contiguous rows of a memory, all pending rejections that rely on McGuiness are deficient. Furthermore, nothing in the Kohn reference provides any teaching that would remedy the deficiencies of McGuiness outlined above. In particular, the Kohn reference, like the McGuiness reference, lacks any suggestion of a single command that causes a fetch of a multi-dimensional block of video data from non-contiguous rows of the memory.

For at least the reasons set forth above, all claims in this application are in condition for allowance. Applicants do not acquiesce to the propriety of any of the rejections of the dependent claims and reserve the right to present additional argument with respect to such claims.

In view of the foregoing comments, Applicants respectfully request reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 17-0026. The Examiner is invited to telephone the below-signed attorney to discuss this application.

Date: 11/22/05

By: 

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